## WHAT IS CLAIMED IS:

1.       A method for synchronizing a scrambling code in a CDMA (Code Division Multiple Access) communication system including a UTRAN (UMTS (Universal Mobile Telecommunications System) Terrestrial Radio Access Network) and a plurality of user equipments (UEs), using orthogonal codes for identifying the UEs and a single up-link scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink dedicated physical channels (DPCHs) using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing, comprising the steps of:

receiving, in the UTRAN, the random access channel signal from a UE to measure a propagation delay time (PD) of the random access channel signal from the UE, and transmitting from the UTRAN a transmission time adjustment value calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between a transmission time point of the signal and a transmission time point of a downlink DPCH; and

determining, in UE, a transmission time of an uplink DPCH signal by receiving the transmission time adjustment value, and scrambling a frame data with an orthogonal code and a scrambling code generated at the time different from the starting time of the frame data with a scrambling code offset calculated from the transmission time adjustment value and the $\tau_{DPCH,n}$, at the transmission time so determined to transmit the message over the uplink DPCH.

2.       The method as claimed in claim 1, wherein the system time is a starting time of common pilot channel (CPICH) signal.

3.       The method as claimed in claim 1, wherein the system time is a starting time of primary common control physical channel (P-CCPCH) signal.

4. The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560

where $T_o$ is a constant value.

5. The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = 2560 - $[(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560]

where $T_o$ is a constant value.

6. The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 256*m

where $T_o$ is a constant value, and m=1,2,3,..,10.

7. The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(256*m) - [(\tau_{DPCH,n} + T_o + 2*PD)$ mod 256*m]

where $T_o$ is a constant value, and m=1,2,3,..,10.

8. The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by subtracting the propagation delay time from a constant value $T_o$.

9. The method as claimed in claim 1, wherein the scrambling code offset is calculated by:

offset = $\tau_{DPCH,n} + T_o + 2PD + L$

where L indicates the transmission time adjustment value.

10. A method for synchronizing a scrambling code in a UE of a CDMA

communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a single uplink scrambling code for the UEs to identify the UTRAN and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink dedicated physical channels (DPCHs) using the

5      single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system time, comprising the steps of:

determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH

10     signal;

creating a scrambling code at the system time;

creating a data frame at the determined transmission time; and

scrambling, at the determined transmission time, the data frame with the scrambling code generated at the time different from the starting time of the frame data

15     with a scrambling code offset calculated from the transmission time adjustment value and the $\tau_{DPCH,n}$, at the transmission time so determined to transmit the message over the uplink DPCH.

11.      An apparatus for synchronizing a scrambling code in a UE of a CDMA

20     communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a single uplink scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink dedicated physical channels (DPCHs) using the single scrambling code, wherein the UEs receive a signal providing system timing

25     provided from the UTRAN and transmit a random access channel (RACH) signal based on the system time, the apparatus comprising:

a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal;

30     a scrambling code generator for creating a scrambling code at the system time;

a frame generator for creating a data frame at the determined transmission time;

and

a scrambler for scrambling, at the transmission time determined by the controller, the data frame with the scrambling code generated at the time different from the starting time of the frame data with a scrambling code offset calculated from the transmission time adjustment value at the system time.

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12. The apparatus as claimed in claim 11, wherein the system time is a starting time of common pilot channel (CPICH) signal.

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13. The apparatus as claimed in claim 11, wherein the system time is a starting time of primary common control physical channel (P-CCPCH) signal.

14. The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

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transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560

where $T_o$ is a constant value.

15. The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

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transmission time adjustment value = 2560 - $[(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560]

where $T_o$ is a constant value.

16. The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

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transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 256*m

where $T_o$ is a constant value, and m=1,2,3,..,10.

17. The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

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transmission time adjustment value = $(256*m) - [(\tau_{DPCH,n} + T_o + 2*PD)$ mod 256*m]

where $T_o$ is a constant value, and m=1,2,3,..,10.

18.     The apparatus as claimed in claim 11, wherein the transmission time adjustment value from a constant $T_o$ is calculated by subtracting the propagation delay time from a constant value $T_o$..

19.     The apparatus as claimed in claim 11, wherein the scrambling code for scrambling the message is delayed by a given scrambling code offset from the scrambling code generated at the system time.

20.     The apparatus as claimed in claim 19, wherein the offset is calculated by:

$$offset = \tau_{DPCH,n} + T_o + 2PD + L$$

where L indicates the transmission time adjustment value.